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MUNI'S PLANS TO ACCOMMODATE DOWNTOWN GROWTH

August 5, 1982

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August 5, 1982

MEMORANDUM

To: City Planning Commission

From: Dean L. Macris, Director

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Subject: Muni's Plans to Accommodate Downtown Growth

The purpose of this memorandum is to put into perspective current discussions regarding the need for additional Muni service created by downtown growth. The memorandum has been prepared with the assistance of Public Utilities Commission staff.

The Downtown Transportation Improvement Program Working Paper I, presented by Department of City Planning staff to the Commission in May, documented projections of additional downtown employment for the next 10-year and 20-year periods, and the residential distribution of these employees within the region. Working Paper I is based on assumptions endorsed by this Department, Muni, the Metropolitan Transportation Commission and the Association of Bay Area Governments (ABAG) and uses employment trends based on Standard Industrial Classification job category data as documented by ABAG. In addition, Working Paper I projects additional demand on all transportation corridors and operators, including Muni, as a result of downtown employment growth, if current modal split patterns continue.

Muni involvement in long-range employment and residence projections is critical because Muni staff is in the process of producing two plans for the system's continued development: a Fleet Rehabilitation and Replacement Plan (a part of the Muni Five-Year Plan 1982-1987) and a Facilities Master Plan. The Public Utilities Commission adopted the Rehabilitation and Replacement Plan in May. The Transportation Policy Group also endorsed the Rehabilitation and Replacement Plan at its June meeting. The plan is designed to accommodate the downtown demand forecast outlined in Working Paper I, as well as additional system demands. It will be revised annually to reflect any new information that may become available and to maintain foresight in planning.

The following material summarizes 1) the pertinent findings of Working Paper I, 2) Muni's plans to accommodate growth, 3) additional improvements planned by Muni, 4) how the Muni plans are expected to be funded, 5) other measures being taken to improve service and meet increased demand, and 6) the situation for the other regional transit operators serving downtown San Francisco.

Summary of Downtown Muni Demand Projections

Working Paper I shows a range of from about 50,000 to 56,000 additional employees working in the greater downtown area by the beginning of the 1990's. The lower, or "expected", number is based on consideration of San Francisco's share of growth in relationship to regional growth trends; the higher, or "maximum", number is based on the historic growth trends in San Francisco taken by itself. Working Paper I notes that it will be appropriate to reconsider these projections when information from the 1980 Census, Downtown EIR or other data sources are available; the Downtown EIR is expected

to provide information which would allow a comparison of land use development trend data with these employment trends.

Working Paper I projects that somewhere between 11,000 to 30,000 of these additional downtown workers would live in San Francisco. There is a wide range here because it is unclear to this point how much housing will be constructed in the City or elsewhere in the region.

Not all of these additional downtown workers are expected go to work during the peak period on an average day. Consequently, Working Paper I reduces employment projections by 16% to reflect varying work hour shifts and absenteeism. This adjustment will more accurately reflect the peak period work trip demand on the transportation system.

Using current modal split patterns, Working Paper I shows that somewhere between 4,500 to slightly more than 12,000 additional San Franciscans would need to be carried on Muni at peak periods daily as a result of downtown growth over the next 10 years. (These figures are modified to include an additional number of new downtown employees who would live on the Peninsula, commute by Southern Pacific/Caltrans commuter rail service and transfer to Muni for the final leg of the trip downtown).

Muni's Plans for Accommodating Growth

Muni has calculated its 10-year vehicle requirements based on the assumption that downtown would add the "maximum" number of new employees (56,000) and that the maximum number of those new employees (30,000) would live in San Francisco. Muni believes it is prudent to plan for the higher end of the range for two reasons. First, based on an analysis of current downtown development trends, Muni believes that employment growth would be higher in the short-run (i.e., up to five years) than that extrapolated from the 10-year ABAG employment projections; as a result, Muni demand projections over a 10-year period likely would have been understated. Second, it is better to err slightly on the side of adequate capacity rather than perpetuate underserved conditions (this is particularly important in the longer-range facilities master planning). Because the plan will be revised regularly, the annual small fleet additions recommended in the Rehabilitation and Replacement Plan may be increased or decreased based on the most current demand projections.

The vehicle Rehabilitation and Replacement Plan is an ambitious one based not only on accomodating this projected downtown growth but also based on assumptions regarding other factors that may effect growth in transit demand:

1) Additional demand was assumed to come from the maximum number of new employees projected for the rest of San Francisco (outside downtown), shown in Working Paper I to be an additional 6,000 workers by 1990.

2) Since some peak period trips are known to be non-work trips, rather than deduct the 16% of workers who would not be seeking peak period service, Muni used a working assumption that an equal 16% percent of its patronage consisted of non-work trips, and that the demand for these non-work trips at peak periods would continue to grow at the same rate as work trips.

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3) Muni assumed that there would be a modal shift over the next ten years of 3%; that is, that a greater percentage of San Franciscans' peak period trips would be made by transit rather than automobile.

Finally, all of these increases in patronage demand were added to the increase in vehicles required for service improvements described in Muni's Service Design Plan (also part of the Muni Five-Year Plan). The Service Design Plan calls for a redeployment and slight increase in Muni's fleet in order to provide better service -- not to provide for growth in patronage. Some of the Service Design Plan vehicle increases are funded/purchased already and will be in operation in the near future, such as the additional 22 LRVs expected to be in service by mid-1983.

The additional service needed was projected over several different "scenarios", or vehicle mixes (different combinations of electric, non-electric, standard-size, articulated vehicles, etc., each with different standard service lives, requiring different rehabilitation schedules for current vehicles). The option selected was a fleet design Muni planners assumed to be the most probable.

Additional Muni Service Improvements

Muni is involved in several efforts aimed at improving service quality, in addition to providing a larger fleet to accomodate growth in demand.

One of the most common ways for understanding and measuring service quality is in terms of passenger comfort and overcrowding. For many years Muni has defined its capacity and maximum acceptable service standard to be a load factor of 1.5 times the number of seats, that is, allowing $33^{1}/_{3}\%$ standees (this varies according to vehicle type; a load factor of 2.0 on LRVs is considered acceptable). Muni's Service Design Plan is not intended to reduce this overall system standard. As indicated in Working Paper I, a 1.5 maximum load factor standard is higher than other Bay Area transit systems. Muni's higher load factors are not a matter of choice; rather, they are necessitated by its inadequate fleet size and constrained operating funds. Golden Gate transit, for example, currently is able to schedule peak service at a 0.9 load factor, due to its adequate fleet size. While other Bay Area transit operators also exceed their peak load factors, overcrowding clearly is a relative problem; exceeding a 1.3 load factor on BART may not appear significant when Muni Metro load factors exceed 2.0.

Not only must Muni schedule at relatively high load factors, but actual peak loads sometimes exceed this standard. Using ride check data from Muni's Schedules and Traffic department, it is calculated that 16% of Muni's peak trips are at load factors of 1.5 or above. Muni currently is conducting a study to more accurately assess the extent of overcrowding.

Muni overcrowding also is accentuated when it experiences maintenance difficulties. Although service reliability and availability in the last three years have been the highest in any of the last ten years, Muni's diesel fleet problems last fall caused load factors to rise substantially when full scheduled service could not be provided due to maintenance problems. Muni realizes that equally important to increasing fleet capacity is its efforts at

keeping the fleet operational; reducing vehicle, electrical or other system breakdowns; and assuring adequate operator/employee scheduling. Muni's efforts to address vehicle maintenance and availability are reflected in the Rehabilitation and Replacement Plan and its Equipment Maintenance Improvement Program. In fact, projected vehicle requirements in the rehabilitation/replacement program are reduced in response to planned maintenance improvements, which allow a reduction in the number of spare vehicles required for normal maintenance.

In addition there are those factors affecting service standards which Muni cannot be expected to solve totally. Another reason for temporary overcrowding is that patronage demand is not spread uniformly over a time period that Muni schedules can meet. That is, there is a "peak of the peak", on some lines of, for example, 30 minutes out of the two hour peak period, during which demand is most intensive. It is very expensive to provide sufficient peak service to accomodate demand surges of short duration. Thus, Muni assumed that future peak service will be based on meeting average peak demand, although Golden Gate Transit, for example, enjoys the luxury of scheduling service for peak of the peak demand. This factor accounts for continued overcrowding during a segment of the peak period.

Some portions of lines often are considerably more crowded than others, due to population density patterns. This has been particularly noticeable on the Muni Metro system where passenger loads within closer-in neighborhoods east of Twin Peaks often exceed even maximum standards, but diminish to more acceptable load standards west of the Castro station.

Finally, Muni does maintain some flexibility in street management and scheduling to move vehicles around to reduce overcrowding. Muni has instituted programs to improve street management (i.e., Transit Line Coordinator program) to reduce the "bunching" situation, where several overcrowded buses are followed by another not at capacity. Some degree of bunching also is caused by traffic patterns, however, which will undoubtedly continue. Muni's ability to schedule vehicles to reduce overcrowding is limited by the need to maintain adequate feeder service to/from major trunk lines, encourage the most cost effective route network overall, and maintain adequate headways on cross-town and neighbhorhood lines. Thus, it is often not acceptable, for example, to reduce a 1.7 load factor on one line by reducing service on a second line, even though the second line may have excess capacity.

Funding for Muni's Fleet Rehabilitation and Replacement Plan is based on the "committed" system, which includes the long-standing 1.5 maximum load factor service standard. Unfortunately, the Metropolitan Transportation Commission (MTC) defines "committed service" as that service which was provided by Muni in 1979. Then, as now, Muni's fleet size was inadequate to accomodate demand. Given current financial constraints, MTC and the U.S. Urban Mass Transportation Administration are not prepared to fund system expansion to a higher service level (lower load factors). Thus, Muni will be unable to reduce overcrowding through federal or regional assistance. However, in a separate proposal to the Mayor, Muni has examined what additional service would be required to reduce load factor levels to between 1.0 and 1.25 during the peak period on each line.

Funding Muni Growth

The total cost of the vehicle rehabilitation/replacement program is estimated by Muni to be $137,425,000 in 1982 dollars, or $188,423,000 escalated at 9% per year through the decade. According to the plan, funds to carry out this program are expected from a variety of sources, including Section 5 and Section 3 Bus Capital from the federal government, state sources, local revenues, and the San Francisco Municipal Railway Improvement Corporation (SFMRIC), a non profit corporation established in 1971 for the purpose of selling bonds for transit improvements. The executive summary of the draft plan concludes that the plan "is practical, feasible, cost effective, and essential to ensuring the availability of reliable vehicles to meet ridership demand over the next ten years."

The capital requirements section of the plan considers two funding "scenarios". The "best case" assumes the most optimistic level of funding from each source, while the "worst case" assumes the most pessimistic. Using the inflated $188 million dollar cost, the best case assumes that $158 million will be forthcoming from the federal and state governments and $35 million from the local source identified in the draft plan as "Assessment District/Development Fee"; in the worst case, Muni assumed $77 million* from the federal and state governments, $0 from the "Assessment District/Development Fee", and $111 million from SFMRIC bonds or other local sources.

Clearly, as it now stands, federal funding is critical to funding the Muni Plan. Muni has been working with other transit operators and the federal government to ensure that the federal funds will be forthcoming, but at this time Muni believes, based on historical allocations and MTC projections, that the more pessimistic "worst case" federal/state funding level ($77 million) is the more realistic one. Over the past five years, federal bus grants to Muni have totalled only $2.02 million. MTC projects, based on current congressional allocation formulas, that Muni will receive about $39 million in federal funds for rubber-tired vehicles over the next five years. Assuming a like projection over the 5-10 year period, MTC federal fund projections would be only $1 million more than the Plan's worst case projection of $77 million..

Because the Muni plan in a "worst case" situation indicates a potential funding shortfall from federal and state sources of as much as $111 million, a variety of local funding sources are being sought.

SFMRIC has approximately $30 million of cash on hand and $30 million of bonds it can sell without a further vote of the people. Thus, total SFMRIC resources are about $60 million. In the Rehabilitation and Replacement Plan, it is assumed that all of these resources would be used, if necessary, to purchase vehicles and construct supporting facilities, leaving a remaining shortfall of up to $60 million.

A primary potential source of local funding for the Plan and its increased operational cost requirement is the development fee adopted by the Board of

*The $77 million is uninflated over the full ten year period; inflation could add $5 million additional, for a total of $82 million, in relationship to the $188 million inflated need.

MUNICIPAL RAILWAY
REHABILITATION AND REPLACEMENT PLAN
EQUIPMENT PLAN
FLEET INVENTORY CHANGES

	1982 Fleet	Retired	Rehab'd then Retired	Reserve Fleet	Purchase	1991 Fleet
Standard Diesels	528	(278)	(195)	(30)	220	245
Articulated Diesels	0				190	190
Standard Trolleys	345				0	345
Articulated Trolleys	0				90	90
LRVS	100				39	139
Cable Cars	40				11	51
PCC street cars	78	(78)				
Total:	1,091	(356)	(195)	(30)	550	1,060
Seat capacity (not including PCC)	50,643					60,504

REHABILITATION AND REPLACEMENT PLAN
FUNDING PLAN
CAPITAL NEED

	(81/82)
1. Rehabilitation of 195 GMC coaches	$10,625,000
2. Purchase of 190 articulated diesels	76,874,000
3. Purchase of 220 standard diesels	52,331,000
4. Purchase of 90 articulated trolleys	40,493,000
5. Assumed cost of facilities	8,000,000
Total	$188,423,000*

*Inflated to Year of Acquisition

REHABILITATION AND REPLACEMENT PLAN
FUNDING PLAN SOURCES OF FUNDS

		Ten Year Totals ($000) Best Case	Worst Case
1.	UMTA Section 5 Tier IV	55,280	30,280
	- May be used for bus purchase and/or rehabilitation and/or facilities - The allocation of funds is based on a formula which uses the weighted age of fleet as a basis. Rehabilitation reduces the weighted age and thus Muni's allocation. - In the best case, would enable purchase of 137 standard diesels over five years. Needs for bus purchases as determined in this plan exceed this limit.		
2.	UMTA Section 3, FAU, AB 1107, STA, Sale/Leaseback	97,376	46,820
	- Rehabilitation with federal funds is limited to 20% of fleet, or 175 vehicles. The requirements of this plan exceed this limit.		
3.	UMTA New Bus Equipment (NBEI)	5,040	0
	- May only be used for articulated trolleys		
4.	Assessment District/Development Fee	35,000	0
	- From capital element of these sources		
5.	SFMRIC and Other Local Sources:		
	- Any remaining capital need is met from this source. - In the best case, current SFMRIC reserves could meet this need through 85/86, at which point $10 million in additional bonds would be required. - In the worst case, reserves last through 83/84. Additional bonds of $123 million would be required through the ten year period.		
	Advances	(--)	121,323
	Recoveries	(--)	(10,000)
	Net	0	111,323
	TOTAL:	$188,423	$188,423

Supervisors, which is intended to be used for both capital and operating expenses caused by growth. As you know, the fee is being legally challenged, but the City Attorney has expressed confidence that the court will sustain the ordinance. In the meantime, the process has begun to collect the fee. Funds will be held in escrow pending the court's determination. The basis for calculating the fee is square footage of additional office space added in a defined "downtown" area. Early estimates indicate that over 11 million square feet of building area already is subject to the fee payment. After deduction of non-rentable and other space uses (such as retail), the City could receive as much as $50 million upon conclusion of the court determination from this source. At an average rate of development of 1.5 million square feet per year (assuming 1.2 million is net additional office space), an additional $40 million might be forthcoming from this source by 1991. While at this point estimates are not precise, this amount could meet the the local share of $35 million projected by Muni in its current "best case" plan for funding the rehabilitation/ replacement program and provide a fund to accomodate the first years of increased operating expenditures.

Other potential local sources of capital also may be identified. Some $55 million in funds including interest, are accumulating from the Business and Payroll tax increase enacted in 1980. I understand that as of today the court has upheld the legality of this tax. Muni could receive a share of these funds for use in funding the rehabilitation/replacement program and operating expenses. The extent to which Muni could draw on this source depends on other demands for these funds; increased demand for these funds is coming from reduced State funding and increased Medicare loads.

In her letter to the City Planning Commission of June 29, 1982, Mayor Feinstein noted that the traditional method for financing capital programs was to use federal grant monies matched by a local contribution raised through the sale of revenue bonds. The Mayor noted that her administration is working to assure that these federal capital grant monies continue. However, she concludes, "should that effort fail, I am fully prepared to recommend the use of our General Fund reserves to the extent necessary to achieve the necessary capacity increases." To that end, the Mayor has forwarded a draft Charter amendment to the Board of Supervisors that would allow use of General Fund monies for Muni capital needs. The Mayor has stated on more than one occasion that providing for the Muni's needs is the top priority for any general funds which become available.

While SFMRIC bonding capacity may be increased through a vote of the people, it must be used as a final resource because of its expensive interest implications. Based on the "worst case" projection in the Rehabilitation and Replacement Plan, financing of the deficit with SFMRIC bonds would increase Muni's annual SFMRIC lease payments from $4 million annually to $15 million annually.

As a first step in the use of General Fund monies for Muni capacity expansion, the Mayor has recommended that $21 million from this year's surplus be earmarked for the capital costs of reducing Muni's load factor to a maximum of 1.25 on all lines during the peak period. These improvements are not reflected in Muni's Service Design Plan and Rehabilitation/Replacement program, but are called for in the separate proposal to the Mayor. To proceed

in this manner, the City must ensure that the availability of local funds for this purpose is not used by regional/federal funding sources as a reason to reduce their commitment to Muni's capital needs. The $21 million does not cover the operating costs of these additional vehicles.

With capital increases the operating expenses for Muni's fleet also continue to grow. Muni's draft Five Year Plan 1982-1987 projects operating expenses based on an earlier and somewhat larger demand projection, but not including the increment of growth in Muni Metro operating costs as a result of Service Design Plan improvements. Given these two factors, it offers a reasonable estimate of what expenses are likely to be. The draft budget grows from $158 million (1982-83) to $176 million (1983-84), with a projection of $245 million (1986-87).

Muni's revenue projections to fund operating expenses (including all revenue sources: federal and state subventions, fare revenue, advertising, and General Fund) indicate that while revenues will match expenses for the current budget year ($158 million in 1982-83), revenues expected in the 1983-84 budget year are $166 million, or $10 million less than projected expenses, and that revenues continue to fall short of expenses each succeeding year ($32 million shortfall in 1986-87).

In making these projections, Muni has assumed that Muni's share of expected City revenues will remain constant. Thus, while adjusted General Fund support rose from $44 million in 1980-81 to $54 million in 1981-82 (an increase of $10 million) and is expected to be $65 million in 1982-83 (an increase of $11 million), Muni's projections show General Fund support at $70 million and $75 million respectively for 1983-84 and 1984-85. As with the SFMRIC bond funds in the case of capital improvements, the General Fund is considered a final resource to be used to support the increasing operating cost shortfall only to the extent other sources cannot be used.

Other Measures for Accommodating Growth

As Working Paper I noted, accommodating growth can be achieved in ways other than capital system expansion. Key additional methods are increasing the number of occupants per automobile (carpooling), and, more directly related to Muni, increasing the use of flextime in order to spread the peak to times where service is now provided but underused. Moreover, there are other Transportation Systems Management (TSM) techniques, such as exclusive bus lanes, which if fully implemented and enforced, would allow Muni to give more service with the same amount of equipment and same number of operators. If there is a sufficient exclusive bus lane system with adequate enforcement, Muni vehicles, freed from congestion, can make more runs over the same routes during the same period of time. The Five Year Plan describes in detail Muni's intention of implementing TSM programs (including exclusive bus lanes and other transit preferential street improvements, as well as self-service fare collection, automatic vehicle monitoring, LRV trainlining and others). The Fleet Rehabilitation and Replacement Plan assumes a .5% annual growth in productivity due to these programs, which results in a similar rate of reduction in projected vehicle requirements. Based on the limited success of current TSM programs (e.g. Flextime and carpooling) an assumed annual productivity increase of .5% is generous. Muni encourages TSM techniques and

will adjust future vehicle projections to reflect proven impacts on transit productivity.

How Other Transit Systems Will Accommodate Growth

Working Paper I indicates that some of the transit operators serving downtown San Francisco are better able than others to accommodate downtown growth. Additional demands are projected for each transit operator based on the current modal share of each. Demand is then compared with projected capacity for each operator, based on the Five-Year Plans and individual service level standards of each operator. (Unlike for Muni, no attempt yet has been made to determine additional demand on each operator caused by a shift in the modal split.) Using this analysis, all operators appear to accommodate the additional peak period person trips anticipated for 1990 except for A/C Transit. (By conscious regional policy, A/C Transit's transbay service is being shifted to BART, and all trips formally projected for A/C ridership are now anticipated to be carried by BART.) Analysis has not been completed as to the effects on the capacity of other systems that would be caused by modal shift, and it has not been possible to reexamine the funding assumptions used by each operator to determine what effect lack of projected funding would have on projected capacity.

BART's Five-Year Plan calls for extensive capital improvements designed to reduce headways, including redesign of the Daly City turnback and the Oakland wye, and purchase of 90 new "C" cars. BART currently has $75 million allocated for the next five years from its reserve fund (construction funds and interest) and is expecting $17 million from local sources over that period; BART also has applied for and is expecting substantial federal rail grant funds. By November 1986 BART expects p.m. peak capacity to grow from 12,168 to 20,779, and to be able to accommodate 9,711 more patrons above the present level in the peak hour and 20,200 more during the peak period.

SAMTRANS plans a net fleet expansion of 36 articulated buses over the next five years, to accommodate 2,700 more passengers above the existing level, by levying a quarter-cent sales tax this year, which eventually would be raised to a half-cent (a surplus would develop from the sales tax in the early years). Caltrans plans to upgrade Southern Pacific commuter rail service, with a net service expansion of 12 new bi-level cars, to be funded by local match money for an UMTA Section 3 grant.

Golden Gate Transit plans to purchase 87 buses over the next 5 years of which only 36 would be used for service expansion to San Francisco during peak periods. The estimated additional 55 inbound trips, corresponding to about 2,475 additional seats, would result in a net gain of approximately 1,845 seats after accounting for passengers displaced by reduced Larkspur ferry service; however, its Five-Year Plan states that expansion of ferry service also could occur if new diesel engines can be installed. Of the 87 buses proposed for purchased, only 15 now have funding committed.

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